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10/518,410	12/17/2004	Hiroshi Ikeda	1254-0266PUS1	7744
2292 7590 05/08/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER CARTER III, ROBERT E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/518,410

Applicant(s)

IKEDA, HIROSHI

Examiner

Robert E. Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-10 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-10 and 13-20 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/17/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. It is suggested that the title be changed to "Double sided flat panel display".

Claim Objections

2. Claim 20 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 20 is exactly the same as claim 10 upon which it depends, and therefore fails to further limit the subject matter of claim 10.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-2, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267, Disclosed in IDS submitted on 12/17/2004, copy also submitted on this date) in view of Lee (US Patent # 4,975,691).

As for claims 1, 2, and 18,

Fukumoto et al. teaches:

A display apparatus comprising: a display panel whose display can be observed from either side thereof; (Fig. 1, # 1).

A display control means (Fig. 3) for displaying a regular image and a mirror image observed from one side of said display panel (Paragraph [0005]).

A pair of liquid crystal shutter means (Paragraph [0012], Fig. 1, # 3, 4) disposed in such a manner as to sandwich said display panel (Paragraph [0011]).

A liquid crystal shutter control means (Fig. 1, # 7) for, while controlling the opening and closing of the liquid crystal shutter means on said one side in synchronism with the regular display by said display control means, said regular display being observed from

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said one side, such that said regular display can be observed, opening and closing the liquid crystal shutter means on said other side in synchronism with the mirror display by said display control means, said mirror display being observed from said one side, such that the regular display can be observed on said other side and for controlling the opening and closing of said pair of liquid crystal shutter means such that said pair of shutter means do not open simultaneously (Paragraph [0015-0016]).

Fukumoto et al. does not teach:

A display control means for displaying a regular image and a mirror image observed from one side of said display panel on said display panel in each unit scan period based on one field unit or one frame unit” or “said display control means comprises a scan inverting circuit for inverting the direction of a horizontal scan on said display panel in each frame or each field”

However, Fukumoto et al. asserts that this operation was well known in the art, so the details were omitted from the specification (Paragraph [0017]).

Said liquid crystal shutter control means controls switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from said scan inverting circuit.

However, Fukumoto et al. discloses that any source can be used to trigger the shutter control means to switch between the shutters (Paragraph [0024]).

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Lee teaches:

A scan inversion symmetric drive circuit (Fig. 1) for driving an electroluminescent display panel (Col. 1, lines 6-9, Fig. 1, # 110) which is capable of displaying a regular image and a mirror image observed from one side of said display panel on said display panel in each unit scan period based on one field unit or one frame unit by inverting the direction of a horizontal scan on said display panel in each frame or each field (Col. 3, line 67 - Col. 4, line 9).

Therefore, since both Lee and Fukumoto et al. are in the same field of endeavor, and because Fukumoto et al. asserts that the driving technique was well known, and that any source can be used as a trigger to switch the shutters, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use the display panel driver in Lee to drive the display panel in Fukumoto et al. to enable display of regular and mirror images in each scan period. It would further have been obvious to control the shutters in Fukumoto et al. based on an output signal from the signal inverting circuit in Lee, enabling the shutter control means to control the opening and closing of shutters in synchronism with the switching of the display period by the display control means.

As for claim 18,

Fukumoto et al. teaches:

A terminal apparatus comprising the display apparatus according to claim 1 (Paragraphs [0020-0021], Fig. 3).

6. Claims 3, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267) in view of Edwards (US Patent # 5,717,412), and further in view of Kanemori et al. (US Patent # 5,164,851).

As for claims 3, 15, and 16,

Fukumoto et al. teaches:

A display apparatus comprising: a display panel (Fig. 1, # 1) having a first display surface (Fig. 1, # 5) and a second display surface (Fig. 1, # 6) and capable of display from both surfaces, namely, said first display surface and said second display surface, wherein display can be observed from either side of said display panel (Paragraph [0005]).

A first shutter means (Fig. 1, # 3) and a second shutter means (Fig. 1, # 4) which are formed by liquid crystal panels (Paragraph [0012]) disposed on said first display surface and said second display surface, respectively, in an opposing manner as to sandwich said display panel (Paragraph [0011]).

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A display control means (Fig. 3) for performing display control of a first display observed from said first display surface side and a second display, which is different from said first display, observed from said second display surface side (Paragraph [0005]).

A liquid crystal shutter control means (Fig. 1, # 7) for controlling said liquid crystal shutter means (Paragraph [0014]).

Fukumoto et al. does not teach:

A display panel having a plurality of picture elements, that perform display based on an input signal, each picture element including a plurality of display elements as a single unit, said display panel being capable of display on both surfaces using a picture element at a selected location.

Wherein said first liquid crystal shutter means and said second liquid crystal shutter means are capable of opening and closing for a single picture element, a plurality of picture elements, or for each said display element.

Wherein the control of the opening and closing of shutters are performed such that the display picture elements on said second surface side are screened while transmitting the display picture elements on said first surface side by said second shutter means upon said first display, and such that the display picture elements on said first surface

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side are screened while transmitting the display elements on said second surface side by said first shutter means upon said second display.

Kanemori et al. teaches:

A display panel having a plurality of picture elements (Col. 1, lines 21-25, Fig. 3, # 40), that perform display based on an input signal (Col. 1, lines 25-28), each picture element including a plurality of display elements (Fig. 3, # 41, 42) as a single unit (Fig. 3, # 40), said display panel being capable of display on both surfaces using a picture element at a selected location (Col. 1, lines 21-25).

Kanemori et al. further teaches that a liquid crystal display device such as the first and second shutters in Fukumoto et al. and the instant application, can also have a plurality of picture elements (Col. 1, lines 21-25, Fig. 3, # 40), that perform display based on an input signal (Col. 1, lines 25-28), each picture element including a plurality of display elements (Fig. 3, # 41, 42) as a single unit (Fig. 3, # 40). This would enable the first and second liquid crystal shutter means to open and close for a single picture element, a plurality of picture elements, or for each said display element. It would also enable the Liquid crystal shutter controller to control the opening and closing of shutters such that the display picture elements on said second surface side are screened while transmitting the display picture elements on said first surface side by said second shutter means upon said first display, and such that the display picture elements on said

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first surface side are screened while transmitting the display elements on said second surface side by said first shutter means upon said second display.

Therefore, since both Kanemori et al. and Fukumoto et al. are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the display device and shutters in Fukumoto et al. with the display panel and the liquid crystal display device in Kanemori et al., to enable higher resolution, gray-scale ability, and one-to one addressing correspondence between the display panel and the shutters.

Fukumoto et al. in view of Kanemori et al. does not teach:

Said liquid crystal shutter control means controls said liquid crystal shutter means such that a regular image can be observed simultaneously from both surfaces of said display panel:

Edwards teaches:

A liquid crystal shutter control means (Fig. 1, # 28) for controlling a first liquid crystal shutter means (Fig. 1, #20), and a second liquid crystal shutter means (Fig. 1, #22) such that during a first frame the first shutter transmits a first image while the second shutter blocks the first image, and during a second frame the second shutter transmits a

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second image while the first shutter blocks the second image, all happening at a frequency high enough that the images appear to be displayed simultaneously (Col. 1, lines 23-47).

Therefore, since both Edwards and Fukumoto et al. disclose a display using a pair of liquid crystal shutters controlled by a liquid crystal shutter controller, and because they are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the pair of liquid crystal shutters and the liquid crystal shutter controller in Fukumoto et al. with the pair of liquid crystal shutters and the liquid crystal shutter controller in Kanemori et al., to enable the double sided display in Fukumoto et al. to appear to simultaneously display an image on each side. Moreover, switching the shutters at a high rate of speed is analogous to multiplexing of the image data, allowing for more data to be displayed at any given time.

7. Claims 7, 8, 9, 10, 13, 14, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267) in view of Kanemori et al. (US Patent # 5,164,851), and further in view of Lee (US Patent # 4,975,691).

As for claims 7-10, 13-14, and 19-20

Fukumoto et al. teaches:

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A first liquid crystal shutter means (Paragraph [0012], Fig. 1, # 3) and a second liquid crystal shutter means (Paragraph [0012], Fig. 1, #4) disposed on said first display surface side and said second display surface side, respectively (Paragraph [0011]).

A display control means (fig. 3) for performing display control such that a first display observed from said first surface side and a second display observed from said second surface side can be viewed as the same display (Paragraph [0005]).

A shutter control switching circuit (fig. 1, # 7) for controlling the opening and closing of said first shutter means and said second shutter means (Paragraph [0014]).

Fukumoto et al. does not teach:

A display panel having a plurality of picture elements, that perform display based on an input signal, each picture element including a plurality of display elements as a single unit, said display panel being capable of display on both surfaces using a picture element at a selected location.

Said first and second liquid crystal shutter means capable of opening and closing for a single picture element, or a plurality of picture elements.

Said liquid crystal shutter controller capable of controlling the opening and closing of shutters such that the display picture elements on said second surface side are

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screened by said second shutter means upon said first display, and the display picture elements on said first surface side are screened by said first shutter means upon said second display

Kanemori et al. teaches:

A display panel having a plurality of picture elements (Col. 1, lines 21-25, Fig. 3, # 40), that perform display based on an input signal (Col. 1, lines 25-28), each picture element including a plurality of display elements (Fig. 3, # 41, 42) as a single unit (Fig. 3, # 40), said display panel being capable of display on both surfaces using a picture element at a selected location (Col. 1, lines 21-25).

That a liquid crystal display device such as the first and second shutters in Fukumoto et al. and the instant application, can also have a plurality of picture elements (Col. 1, lines 21-25, Fig. 3, # 40), that perform display based on an input signal (Col. 1, lines 25-28), each picture element including a plurality of display elements (Fig. 3, # 41, 42) as a single unit (Fig. 3, # 40). This would enable the first and second liquid crystal shutter means to open and close for a single picture element, or a plurality of picture elements. It would also enable the Liquid crystal shutter controller to control the opening and closing of shutters such that the display picture elements on said second surface side are screened by said second shutter means upon said first display, and the display picture elements on said first surface side are screened by said first shutter means upon said second display

Therefore, since both Kanemori et al. and Fukumoto et al. are in the same field of endeavor, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the display device and shutters in Fukumoto et al. with the display panel and the liquid crystal display device in Kanemori et al., to enable higher resolution, gray-scale ability, and one-to one addressing correspondence between the display panel and the shutters.

Fukumoto et al. in view of Kanemori et al. does not teach:

Wherein said display control means, while switching the display period of said first display and said second display, performs display control such that said first display and said second display have a relationship where they are substantially mirror images of each other upon viewing said first display and said second display from either said first surface side or said second surface side with said shutters open.

However, Fukumoto et al. asserts that this operation was well known in the art, so the details were omitted from the specification (Paragraph [0017]).

Wherein said display period, in which said first display and said second display are switched is a unit scan period based on a single field unit or a single frame unit.

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A memory circuit for storing a data signal in each scan unit of said picture element based on said input signal.

A scan driving circuit for providing a scan driving signal to said display panel in the scan order of each said scan unit.

A signal inverting circuit for inverting the inverted scan signal outputted from said scan inverting circuit.

A signal driving circuit for changing the output order of said image signal received from a memory circuit in each scan order, while outputting to the display panel an image signal that is used to perform a first image display by said scan order and a second image display by the inverted scan order based on an inverted scan signal at different times, based on said data signal stored in said memory circuit and the scan driving signal outputted from the scan driving circuit.

A shutter switching circuit for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from said signal inverting circuit, wherein, upon alternatively displaying either said first display or said second display based on said image signal outputted from said signal driving circuit in each said scan unit, the display surface side on which display has not been selected is screened alternatively by said first or second shutter means.

Wherein said shutter control means controls the opening and closing of shutters in synchronism with the switching of said display period by said display control means.

However, Fukumoto et al. discloses that any source can be used to trigger the shutter control means to switch between the shutters (Paragraph [0024]).

Lee teaches:

A scan inversion symmetric drive circuit (Fig. 1) for inverting the scan order in each said scan unit while driving an electroluminescent display panel (Col. 1, lines 6-9, Fig. 1, # 110). Said scan inversion symmetric drive circuit capable of performing display control such that in each unit scan period based on a single field unit or a single frame unit, said first display and said second display have a relationship where they are substantially mirror images of each other upon viewing said first display and said second display from either said first surface side or said second surface side with said shutters open (Col. 3, line 67 - Col. 4, line 9).

A memory circuit for storing a data signal in each scan unit of said picture element based on said input signal (Col. 25, lines 65 – Col. 26, line 3).

A scan driving circuit (Fig. 1, # 130, 140) for providing a scan driving signal to said display panel in the scan order of each said scan unit (Col. 8, lines 26-31).

A signal inverting circuit for inverting the inverted scan signal outputted from said scan inverting circuit.

A signal driving circuit (Fig. 1) for changing the output order of said image signal received from a memory circuit (Col. 25, lines 65 – Col. 26, line 3) in each scan order, while outputting to the display panel (Col. 1, lines 6-9, Fig. 1, # 110) an image signal that is used to perform a first image display by said scan order and a second image display by the inverted scan order based on an inverted scan signal at different times, based on said data signal stored in said memory circuit and the scan driving signal outputted from the scan driving circuit (Fig. 1, # 130, 140).

Therefore, since both Lee and Fukumoto et al. are in the same field of endeavor, and because Fukumoto et al. asserts that the driving technique was well known, and that any source can be used as a trigger to switch the shutters, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use the display panel driver in Lee to drive the display panel in Fukumoto et al. to enable display of regular and mirror images in each unit scan period based on a single field unit or a single frame unit. It would further have been obvious to control the shutters in Fukumoto et al. based on an output signal from the signal inverting circuit in Lee, enabling the shutter control

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means to control the opening and closing of shutters in synchronism with the switching of the display period by the display control means.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267) in view of Edwards (US Patent # 5,717,412), and Kanemori et al. (US Patent # 5,164,851) and further in view of Lee (US Patent # 4,975,691).

As for claim 4, Fukumoto et al. in view of Edwards, and in further view of Kanemori et al. teaches all the claimed limitations of claim 3, however, they do not teach:

Wherein said display control means causes said mirror image to be displayed alternately in each horizontal scan by the one set and the other set of said single picture element.

However, Fukumoto et al. asserts that this operation was well known in the art, so the details were omitted from the specification (Paragraph [0017]).

Lee teaches:

A scan inversion symmetric drive circuit (Fig. 1) for display control of an electroluminescent display panel (Col. 1, lines 6-9, Fig. 1, # 110) which is capable of

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displaying a mirror image alternately in each horizontal scan by the one set and the other set of said single picture element. (Col. 3, line 67 - Col. 4, line 9).

Therefore, since both Lee and Fukumoto et al. are in the same field of endeavor, and because Fukumoto et al. asserts that the driving technique was well known, and that any source can be used as a trigger to switch the shutters, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use the display panel driver in Lee to drive the display panel in Fukumoto et al. to enable display of regular and mirror images alternately in each horizontal scan by the one set and the other set of said single picture element. It would further have been obvious to control the shutters in Fukumoto et al. based on an output signal from the signal inverting circuit in Lee, enabling the shutter control means to control the opening and closing of shutters in synchronism with the switching of the display period by the display control means.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267) in view of Lee (US Patent # 4,975,691), and further in view of Arai (US Patent # 5,357,355).

As for claim 17, Fukumoto et al. in view of Lee teaches all the claimed limitations of claim 1, however, they do not teach:

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Wherein the display control means of said display panel and said shutter means are controlled by the same circuit.

Arai teaches:

A double sided thin panel display (Fig. 4) which utilizes an electroluminescent display panel (Fig. 4, # 11a) sandwiched between a liquid crystal shutter panel (Fig. 4, # 11b) and a shutter mode liquid crystal display panel (Fig. 4, # 11h), all three being controlled in the same circuit by a single controller (Fig. 4, # 11m)

Therefore, since both Arai and Fukumoto et al. are in the same field of endeavor, and because both Arai and Fukumoto et al. disclose an electroluminescent panel sandwiched between two shutter mode liquid crystal panels, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use the display control circuit in Arai to drive the display panel in Fukumoto et al. to control both the display panel and shutter panels with the same control circuit.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Okumura et al. (US Patent # 5,572,343) discloses display system using Liquid crystal shutters.

Okada et al. (US Patent # 5,719,651) discloses a liquid crystal display with subpixels

Antila et al. (US Patent # 6,583,770) discloses a display viewable from two sides

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Yoon (US Patent # 6,697,083) discloses a display viewable from two sides

Parthasarathy et al. (US Patent # 6,40,031) discloses a transparent EL display

Cheung et al. (US Patent # 6,541,908) discloses a transparent EL display

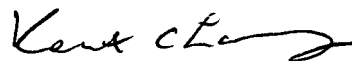
Otsuka (Japanese patent # JP 07218899 A) discloses a transparent display sandwiched between two liquid crystal shutters to form a double sided display panel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert E. Carter whose telephone number is 571-270-3006. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on 571-272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

REC

A handwritten signature in black ink, appearing to read "Kent Chang", with a stylized flourish at the end.

KENT CHANG
PRIMARY EXAMINER